Rural Forest Program

Forest Monitoring Baseline Report

April 1998

I. Basis for Rural Forest Monitoring

Comprehensive Plan Policy R-108 directs the County to develop a monitoring program to evaluate the success of the forest incentive program and to issue an annual report, which will include recommendations for any program or regulatory changes. The Lower Cedar River Basin Plan also requires monitoring to evaluate whether an incentive approach achieves the goal of retaining long-term forest uses in the basin. This report describes the baseline conditions, as of December 31, 1996, for the Rural Forest District and for the Lower Cedar River Basin. Annual reports will document the changes from the previous year and discuss significant trends. The first annual report, which will be completed in the spring of 1998, will report on changes that occurred in 1997.

Policy Basis for the Rural Forest District

Several Countywide Planning Policies (CPP) provide a policy basis for the Rural Forest District. Policy LU-8 states that retention of resource-based uses and conservation of natural resource lands are important for maintaining the traditional character and the environmental functions and values of the Rural Area. This policy required the County to designate a Rural Forest District by December 31, 1995, and it also lists general designation criteria. Policy LU-9 states that land uses within designated Rural Forest Districts should be limited to residences at very low densities, and farming and forestry-related uses. Policy LU-12 describes low densities as one home per 20 acres to protect forestlands designated as part of the Rural Forest District.

The King County Comprehensive Plan (KCCP) also includes policies regarding the Rural Forest District. These policies were amended in 1996, moving from an emphasis on regulation to an incentive approach. Prior to the 1996 amendments, Policy R-108 required that a Rural Forest District be designated and zoned by December 1996. Permitted uses in the district were to be limited to residences at very low densities (one home per 20 acres). The policy also called for encouraging and expanding forestry in the district through incentives. The 1996 amendments to policy R108 did the following: 1) eliminated the deadline for zoning the district; (2) specified that the incentive program would be available to property owners no later than 1998; (3) stated that very low densities would be achieved through regulatory and incentive programs; and (4) required monitoring and annual reports to evaluate the success of the incentives program and to recommend program or regulatory changes, if warranted.

KCCP Policy R-204 was also amended in 1996. It originally stated that a residential density of one home per 20 acres shall be applied to lands in the Rural Area that were managed for forestry and qualified for Rural Forest District designation. The 1996 amendment deleted the word “applied” and instead said that the 20-acre density shall be achieved through a combination of regulatory and incentive programs.

Rural Forest District Designation

The Rural Forest District originated as “study areas” in the 1994 King County Comprehensive Plan (Chapter 6, Forestry Lands Map). These study areas were selected from a review of parcel sizes (1992 GIS parcel coverage) and land cover determined from a 1991 satellite image. The study areas were predominantly forested parcels of at least 20 acres.

In 1995, the King County Council adopted these study areas (with minor changes) as the initial Rural Forest District by amending the KCCP Forestry Lands Map. The 1996 KCCP amendment included a minor change to the district, the removal of five parcels (approximately 43 acres) from the Rural Forest District within the Snoqualmie Joint Planning Area, southwest of the City of Snoqualmie. The Rural Forest District is shown on Map 1 (at the end of this report).

Neither the study areas nor the Rural Forest District were mapped on the Land Use Map or any other parcel-specific map. A parcel-specific analysis was not conducted on the district until the 1996 baseline study, which is described below.

Analysis of Rural Forests

Forestry Program staff analyzed the Rural Forest District and adjacent areas in 1996. They examined forest cover, zoning, parcel size, ownership, and land use compatibility with long term forestry. The study area (Map 2) includes most of the rural area except for: Vashon Island; the rural area south of the Green River; the rural area north of the Fall City Road and west of the Redmond watershed; and the rural area along the South Fork of the Skykomish River in northeastern King County. These areas were not studied because either the predominant parcel size was too small (< 4 acres), the area generally lacked forest cover, or the area was not close to the Rural Forest District.

In order to gauge the extent of forested area with parcels large enough to be managed for forestry, staff identified all of the parcels in the study area that were 4 acres or larger and were at least 65% forested. The percentage of forest cover was interpreted from 1995 Washington State Department of Natural Resources aerial photographs. Forest cover was estimated to the nearest 5% interval between 65% and 100%. Recent clear cuts and plantations were considered to be forested, unless site alterations (such as clearing and grading) indicated that the parcel was in the process of being converted from forest use. The four-acre minimum was used because lots smaller than 4 acres were considered too small for practical forest management.

Finally, the analysis identified plats, short plats, conditional use permits, and special use permits that will result in uses incompatible with forestry. Staff reviewed permit data from 1986 through 1996 to identify parcels with proposed projects, and then examined project files to determine if the proposed action would preclude continued forestry on the parcel.

Direction from Lower Cedar River Basin Plan

The Lower Cedar River Basin and Nonpoint Pollution Action Plan was adopted by the King County Council during the summer of 1997. The plan includes a forest incentive program to ensure that the basin has clean, stable, and healthy streams. Forest retention also protects the quality and quantity of ground water, and reduces tributary flooding, erosion, sedimentation, and water quality degradation. The Lower Cedar River Plan requires monitoring with annual progress reports. During the next five years, the forest incentive program will be evaluated by

the Cedar River Council to determine if it is achieving the goal of maintaining forest cover in the basin.

The baseline monitoring program includes the portions of the basin zoned Rural or Forest, and measures the same parameters as those used in the Rural Forest District. Approximately 57% of the basin is zoned Rural, and 18% is zoned Forest and located in the Forest Production District (FPD). The remaining 25%, which is zoned for urban land uses, is not included in the monitoring program because the forest incentive program is not focused in the urban area. Tables throughout this report will refer to the non-urban part of the basin (See Map 2). This refers to the area with either rural or forest zoning.

Policy Direction for Incentive Approach

The KCCP includes several policies in Chapter 3 (Rural Land Use) and in Chapter 6 (Resource Lands) that recommend the use of incentives to preserve forest land in the FPD, the Rural Forest District, and the entire rural area. This approach was expanded with the adoption of the *Farm and Forest Report – A Strategy for Preserving the Working Landscapes of Rural King County*. The report recommended a strong package of incentives as the most effective means of conserving rural farm and forestlands. The incentive approach was widely supported by citizens during development of the farm and forest report. Similarly, citizen input to the Lower Cedar River Basin Plan resulted in the Forest Incentive Program being adopted as part of the Plan in place of clearing restrictions.

The County has since initiated or expanded several of the recommended incentive programs. The Farm and Forest newsletter, which notifies rural residents about the various programs, as well as building an appreciation for the importance of forests, is being sent to most of the rural area and the FPD. Two foresters have been hired to provide technical assistance to forest landowners. Several series of coached forest stewardship classes have provided assistance in forest inventory, identification of management objectives, and development of forest management plans. A Forest Advisor series has provided volunteers with enough practical forestry information that they are now offering help to neighbors, writing newspaper articles, and developing a resource directory. There has been an increase in the promotion of the current use taxation programs, including the new forestry category under the Public Benefit Rating System (PBRS). Further, a program to transfer development rights (TDR) out of the Rural Forest District is being developed. Progress on these incentive programs will be tabulated in the annual monitoring reports.

II. Initial Results

Two major findings resulted from the 1996 study of the Rural Forest District:

(1) Areas outside the Rural Forest District contain a significant amount of the forest cover in the rural area. Many forested parcels, large enough to be managed for forestry, are located in the rural area outside of the designated Rural Forest District.

(2) The designated Rural Forest District includes areas that do not belong in the district, such as parcels that do not have rural zoning, or that have existing uses or permits approved that preclude continued forestry. Most of these were errors in the initial

designation, which were not apparent until the completion of a parcel-specific-analysis with GIS and permit data.

The first major finding from the study is that there are extensive forested areas outside the Rural Forest District. Although the forested lots outside the district are generally smaller than the lots in the district, there are many that are large enough for forest management and they represent a significant part of the rural forest land base. The criteria used to define forested parcels were lot size of at least four acres and at least 65% forest cover. Approximately 5,000 parcels in the study area met these criteria. Three thousand five hundred of these parcels were located outside the district. The parcels outside the district that met the criteria contain 27,000 acres of forested land. Map 2 shows all the parcels that met the study criteria.

The forested land outside the district is extensive enough to provide many of the benefits provided by the forest land within the district. Many of the incentives offered by the County are as appropriate outside the district as within the district. The Farm and Forest newsletter is sent to residents within the entire study area, as well as the FPD, the Agricultural Production District and Vashon Island. The forestry program offers technical assistance, education, and tax incentives throughout the rural area. Therefore, the entire rural area will be monitored for changes in forest cover and participation in incentive programs.

The second major finding is that there are a number of errors in the district designation. Because the original study areas were designated without a detailed analysis or research on existing permits, the district includes some areas where the designation is technically inconsistent with zoning or existing use. For example, some of the district has urban, mineral or agriculture zoning. Consequently, to create a more accurate baseline for monitoring, these inconsistencies were not included in the district analysis. The areas removed from the baseline adjusted district are as follows: 1) approximately 4,000 acres with urban, agriculture, forest, or mineral zoning; 2) the King County Landfill; 3) the Snoqualmie joint planning area; 4) subdivisions with preliminary approval by the end of 1996 that proposed to create lots smaller than 4 acres; 5) Conditional Use Permits approved by the end of 1996 that precluded continued forestry use; 6) recorded plats with lots smaller than 4 acres; and 7) County, State and City Parks. Table 1 shows the acreage of each category.

The adjusted Rural Forest District more accurately reflects the acreage, within the District, where the Rural Forest Program is being applied, and the areas where changes should be monitored. Parks are removed from the baseline because they are already protected from the land use changes, such as subdivision, that are being monitored. However, the forested parks contribute to the goal of retaining large blocks of contiguous forest cover. Therefore, forest cover and the development of facilities in Rural Forest District parks will be monitored, and the results included in annual reports, separate from the data on non-park lands. To differentiate between the designated district and the portion of the designated district proposed for monitoring, this report will call the baseline area the adjusted Rural Forest District (Map 3).

The aerial photograph analysis showed that most of the adjusted district met the parcel size and forest cover criteria. The forested portion of these parcels cover 83% of the adjusted district, over 37,000 acres. Over 80% of the adjusted district is in parcels larger than 20 acres.

Because the adjusted district has large areas of contiguous forest, it generally has more flexibility for forest activities, and greater economic and ecological benefits, than areas outside the district. The monitoring program for the adjusted district will include land segregation trends and forest practices, as well the forest cover and incentive monitoring that will be done for the entire rural area.

Table 1: Adjusted Rural Forest District - 1996 Baseline

Adopted Rural Forest District	57,955 ac
Parcels within the Urban Growth Area	(1,807 ac)
Parcels zoned "F", "M" or "A"	(2,227 ac)
Park (City, County, State).	(4,487 ac)
King County Landfill	(940 ac)
Snoqualmie joint planning area	(1,033 ac)
Recorded plats (as of 11/26/96) with forest cover < 65% and/or lots < 4 acres	(100 ac)
Preliminary approved plats (11/26/96) with forest cover < 65 % and/or lots < 4 acres	(1,794ac)
Approved Conditional Use Permits	(192ac)
Baseline Acreage Adjusted District (for monitoring purposes)	45,375 ac

III. Plan for Continued Monitoring

The monitoring program in the adjusted Rural Forest District and the Lower Cedar River Basin will be more extensive than the monitoring in the rest of the rural area. The rural area monitoring will include land cover changes, and participation in the incentive programs. Monitoring in the Lower Cedar River Basin and the adjusted district will also track land segregations and forest practice permitting.

Periodic updated analysis and reports will document changes. Most of the data will be compiled annually. Because the forest cover analysis is labor-intensive and depends on the availability of new aerial photos and satellite images, forest cover changes will be reported less frequently, but at least every five years. Forest cover for Vashon Island, although not available for this report, will be included in future reports.

Rural Area Monitoring

1. Participation in incentive programs:
   a. Forest Management Plans completed and acreage covered by these plans
   b. Acres enrolled in Current Use Taxation related to forest management
   c. Landowners who have attended forestry classes and workshops
   d. Landowners who have received technical assistance, and type of assistance
   e. Number of landowners contacted
   f. Residential density transferred out of the Rural Forest District from the transfer of development rights program.
2. Forest Cover.

a. interpretation of aerial photographs
b. land cover classification of satellite imagery

Rural Forest District and Cedar River Basin Monitoring

1. Participation in incentive programs, as described above.
2. Forest Cover, as described above.
3. Forest Practice applications, including class, acreage, and type of activity
4. Land use conversion trends shown by:
   a. subdivision of parcels such as plats and short plats
   b. Special Use and Conditional Use Permits that reduce forest cover
5. Acres of land acquired for the rural forest program or to accomplish Lower Cedar River Basin Plan objectives.

IV. Specific Baseline Data

This section describes the baseline conditions for the adjusted Rural Forest District and the Lower Cedar River Basin. Although the two geographic areas are combined under each heading, they are not intended to be compared with each other. They are different geographic areas that are being monitored for slightly different reasons. This section also contains the baseline forest cover information, based on the satellite image, for all of the rural area except for Vashon Island.

Size & number of parcels

The size and number of parcels are indicators of the types of forest activities that are likely to occur within the adjusted district or Lower Cedar River Basin. Larger parcels offer more economic opportunities. Forest practices on larger parcels and larger landholdings are likely to be more commercial. Even age management (clear cuts) and shorter tree rotations are likely to be practiced on these areas. Smaller parcels are likely to be managed for different goals, especially if they are residential. Forestry practices become more limited and difficult as parcel size decreases. The size and number of parcels is also a leading indicator of changes to forest cover. As smaller parcels become residential lots, forest cover will diminish and become more fragmented.

The adjusted Rural Forest District encompasses 45,375 acres and 2,973 parcels. Approximately 81% of the area is in parcels of at least 20 acres. Figure 4 shows all parcels in the rural area that are 20 acres or larger.

In the non-urban part of the Lower Cedar River Basin, there are 5,512 parcels, which cover 28,934 acres. Approximately 57% of this non-urban area contains parcels of at least 20 acres.

Table 2 shows the number of parcels and acreage within the adjusted district and the non-urban part of the Lower Cedar River Basin by various parcel sizes. The 7.5 and 17.5 parcel sizes were used because these are thresholds for an extra dwelling unit when calculating allowable dwelling units under the zoning code (21A12.070) for RA-5 zoning. For example, one dwelling unit is allowed on a 7.49 acre parcel, and two dwelling units are allowed on a 7.5 acre parcel with RA-5 zoning.

Table 2: Size and Number of Parcels

	Adjusted District			Lower Cedar River Basin (non-urban)		
Size (acres)	# of parcels	Total Acres		# of parcels	Total Acres	
≥ 20	984	36977		177	16502	
17.5-19.99	95	1811		34	642	
7.5 - 17.49	248	2841		254	2697	
4 – 7.49	494	2557		803	4147	
< 4	1152	1188		4244	4946	
Total	2973	45375		5512	28934	

Ownership

Approximately 1,700 landowners have holdings in the adjusted district. Approximately 400 (24%) own at least 20 acres and these holdings account for 88% of the district.

There are approximately 5,000 landowners in the non-urban part of the Lower Cedar River Basin. About 90 (2%) of these owners own at least 20 acres, with this combined holdings accounting for 62 % of the non-urban basin.

Table 3: Ownership Patterns

Adjusted Rural Forest District

Ownership	# of owners	% of owners in District (by number)	Acres	% of acres in adjusted Dist. (by Area)
> 500 acres	8	0.5 %	20221	44.6
40 – 500 acres	139	8.1	12888	28.4
20 – 40 acres	261	15.2	6953	15.3
4 – 20 acres	554	32.4	4313	9.5
< 4 acres	750	43.8	1000	2.2
Total	1712		45375	

Lower Cedar River Basin (Non-urban only)

Ownership	# of owners	% of owners in District (by number)	Acres	% of acres in Basin (by area)
> 500 acres	6	0.13 %	13623	47.1
40 – 500 acres	33	0.73	2923	10.1
20 – 40 acres	50	1.11	1332	4.6
4 – 20 acres	992	22.05	6864	23.7
< 4 acres	3417	75.96	4191	14.5
Total	4498		28933	

Zoning

Zoning indicates the potential fragmentation and build-out capacity and of an area. As Table 4 indicates, nearly half of the adjusted district allows densities that are at least four times the target density. Future monitroing of parcel segregation will track trends toward these potentials.

Table 4: Zoning

Adjusted District

Zone	Acreage	% of area	# of parcels	% of parcels
RA5	23,369	52	1723	58
RA 10	21,413	47	1122	38
RA 2.5	313	1	97	3
Other	69		7	

Lower Cedar River Basin (Non-urban zoning only)

Zone	Acreage	% of area	# of parcels	% of parcels
RA 5	18,255	63	4690	85
RA 10	1,879	6.5	84	1.1
RA 2.5	567	2	536	10
F (forest)	6,987	24	49	3
Other	1,246	4.5	153	0.9

Forest Practice Applications

The number, acreage, and type of forest practices are important to monitor because they are an indicator of the viability of forestry in the rural area. Class 4 G forest practices indicate conversions to a non forest use. Forest Practice Applications (FPA) also will be monitored in the FPD since this is the zone where most commercial forest operations. The FPD can serve as a control area to determine if trends are unique to the rural area. See Appendix A for a description of the classes of forest practices under the Washington Forest Practices Act.

In 1996, 29 forest practice applications were approved within the adjusted district. The applications proposed 678 acres to be harvested and 11.6 miles of road to be built. Three of the applications were classified as forest practices intending to convert the land to a use other than forestry (FPA class IV general). These applications proposed to convert 16 acres.

There were 11 approved forest practice applications within the non-urban part of the Lower Cedar River Basin. These applications proposed to harvest 354 acres and build 2 miles of road. Two applications (zoned rural) proposed to convert 25 acres to non forestry use.

Table 5: 1996 Forest Practice Applications

Adjusted District

FPA Class	# applications	Acres to be harvested *	Acres to be Sprayed*	Miles of Road to be built*
2	10	45	--	--
3	14	560	612	10.7
4G	3	16	--	--
4S	2	57	--	0.9
Total	29	678	612	11.6

Lower Cedar River Basin (non-urban)

FPA Class	# applications	Acres to be harvested *	Acres to be Sprayed*	Miles of Road to be built*
2	3	19	0	0
3	6	310	728	2.0
4G	2	25	0	0
4S				
Total	11	354	728	2.0

Forest Production District

FPA Class	# applications	Acres to be harvested *	Acres to be Sprayed*	Miles of Road to be Built *
2	3	33	0	0.3
3	130	12,837	4,453	79.5
4G	1	4	0	0.8
4S	1	45		0.2
Total	135	12,919	4,453	80.8

* according to the Forest Practice application

Current Use Taxation

Approximately 36% of the adjusted district is enrolled in current use taxation related to forestry. Most of this acreage is enrolled in the Forestland Program; only 1% is enrolled in the Timberlands Program. In the non-urban portion of the Lower Cedar River Basin, 16% of the area is enrolled in current use taxation related to forestry. Approximately 4,535 acres are enrolled in the Forestland Program and 18 acres are enrolled in the Timberland Program. Table 6 shows the acres and number of parcels enrolled in these current use taxation programs. Appendix B briefly describes the Forest and Timberland Programs.

Table 6: Current Use Taxation Related to Forestry

	Adjusted District				Lower Cedar River Basin (non-urban)		
	Total acres	% of area	# of parcels		Total acres	% of area	# of parcels
Forestland	15774	35	390		4535	16	76
Timberland	457	1	32		18	0	1

Forest Cover

A 1995 Landsat image was used to classify the adjusted District, the Lower Cedar River Basin, and the rural zone into 16 land cover types. A description of these cover types is presented in Appendix C. The results of this classification is presented in Table 7 and 8. As mentioned previously, the Washington State Department of Natural Resources aerial photograph analysis revealed that approximately 5,000 parcels in the study area had more than 65% forest cover. When these results were compared with the aggregate forest cover determined through the satellite image, the results were remarkably close. The photo results showed that on the 5,000 parcels that met the criteria, approximately 64,750 acres were forested. The satellite image showed 63,400 acres of forest cover on the same area. The difference is approximately 2%. Based on this comparison, staff were confident enough in the satellite image classification to extend the classification to an area larger than that analyzed through photo interpretation.

According to the satellite image, 68% of the rural area, excluding Vashon Island, is forested. In the adjusted Rural Forest District, 87% of the area is forested. These percentages assume that the 6 cover types, described in Appendix C, can be summed to represent an aggregate forest cover type.

The Lower Cedar River Basin also was classified into these 16 land cover types by drainage subbasin (Appendix D). Approximately 61% of the basin contains forest cover. This figure rises to 72% when only the non-urban area is analyzed for forest cover.

Figures 1, 2, and 3 show pie charts of major landcover types from the satellite image for the adjusted district, the Lower Cedar River Basin, and the rural area (excluding Vashon Island).

Table 7: Landcover Types from 1995 Landsat Imagery for the Adjusted Rural Forest District and the Rural Zone of King County (excluding Vashon Island)

Adjusted Rural Forest District

Landcover	*Acres*	*% of District*
Mixed Forest	18,726	38.58%
Deciduous	11,879	24.47%
Conifer-Early	3,688	7.60%
Conifer-Middle	2,467	5.08%
Conifer-Mature	126	0.26%
Recently Cleared	334	0.69%
Scrub/shrub	5,132	10.57%
Grass-brown	805	1.66%
Grass-green	575	1.18%
Developed Low Intensity	3,927	8.09%
Developed Medium Intensity	270	0.56%
Developed High Intensity	128	0.26%
Bare Ground	231	0.48%
Bare Rock	4	0.01%
Open Water	216	0.44%
Shadow	33	0.07%
Total	48,543	100%
Aggregated Forest Cover*	**42,018**	**86.6%**

Rural Area ("RA") zone (excluding Vashon Island)

Landcover	*Acres*	*% of District*
Mixed Forest	59,304	28.71%
Deciduous	49,773	24.09%
Conifer-Early	5,928	2.87%
Conifer-Middle	5,088	2.46%
Conifer-Mature	208	0.10%
Recently Cleared	1,505	0.73%
Scrub/shrub	19,650	9.51%
Grass-brown	8,178	3.96%
Grass-green	3.514	1.70%
Developed Low Intensity	44,109	21.35%
Developed Medium Intensity	4,684	2.27%
Developed High Intensity	915	0.44%
Bare Ground	1,535	0.74%
Bare Rock	54	0.03%
Open Water	2,075	1.00%
Shadow	47	0.02%
Total	206,570	99.98%
Aggregated Forest Cover*	**139,952**	**67.75%**

***Aggregate Forest Cover includes mixed forest, deciduous, conifer-early, conifer-middle, conifer-mature, and scrub/shrub land cover types.

Table 8: Lower Cedar River Landcover Types from 1995 Satellite Imagery

Urban/Rural	*Landcover*	*Acres*	*% of Basin*
Rural	Bare Ground	463.17	1.50%
	Bare Rock	10.50	0.03%
	Conifer - Early	1,261.32	4.09%
	Conifer - Mature	113.67	0.37%
	Conifer - Middle	3,350.44	10.88%
	Deciduous	6,124.66	19.88%
	Developed High Intensity	107.49	0.35%
	Developed Low Intensity	5,749.53	18.66%
	Devloped Med Intensity	697.76	2.26%
	Grass - Brown	890.97	2.89%
	Grass - Green	261.31	0.85%
	Mixed Forest	7,637.26	24.79%
	Open Water	196.76	0.64%
	Recently Cleared	240.47	0.78%
	Scrub/Shrub	3,697.78	12.00%
	Shadow	3.55	0.01%
	Aggregated Forest Cover	**22,185.12**	**72.01%**
Urban*	Bare Ground	1,010.35	9.32%
	Bare Rock	36.60	0.34%
	Conifer - Early	8.03	0.07%
	Conifer - Middle	17.14	0.16%
	Deciduous	1,655.92	15.28%
	Developed High Intensity	253.59	2.34%
	Developed Low Intensity	3,161.25	29.16%
	Devloped Med Intensity	2,519.24	23.24%
	Grass - Brown	417.30	3.85%
	Grass - Green	143.78	1.33%
	Mixed Forest	1,007.26	9.29%
	Open Water	92.82	0.86%
	Recently Cleared	88.19	0.81%
	Scrub/Shrub	427.18	3.94%
	Shadow	0.77	0.01%
	Aggregated Forest Cover	**3,115.54**	**28.74%**
Basin Total Aggregated Forest Cover		**25,300.66**	**60.75%**
Basin Total Area		**41,646.07**	

Lower Cedar River Basin Plan Forest Incentive Program applies only to the rural area of the Lower Cedar River Basin. Urban area forest cover included for information only.

****** Aggregate Forest Cover includes mixed forest, deciduous, conifer-early, conifer-middle, conifer-mature, and scrub/shrub land cover types.***

Figure 1: Landcover for the Adjusted Rural Forest District determined through satellite imagery

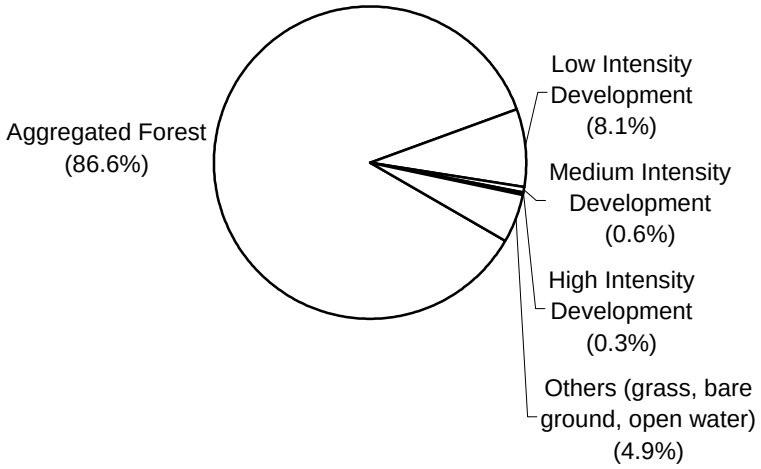


Figure 2: Landcover for the Rural and FPD parts of the Lower Cedar River Basin determined through satellite imagery

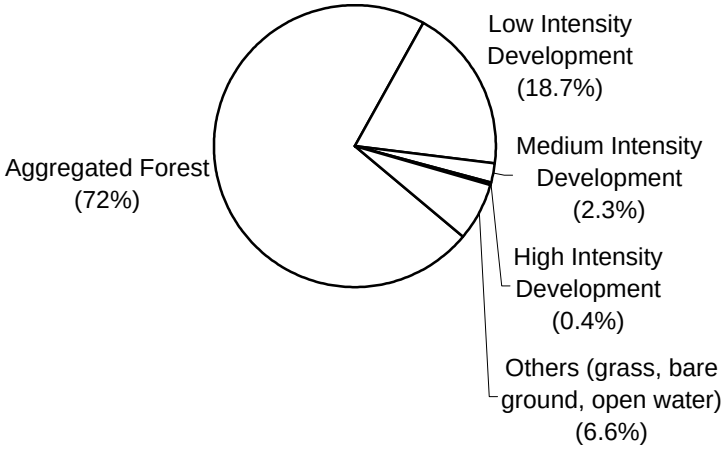
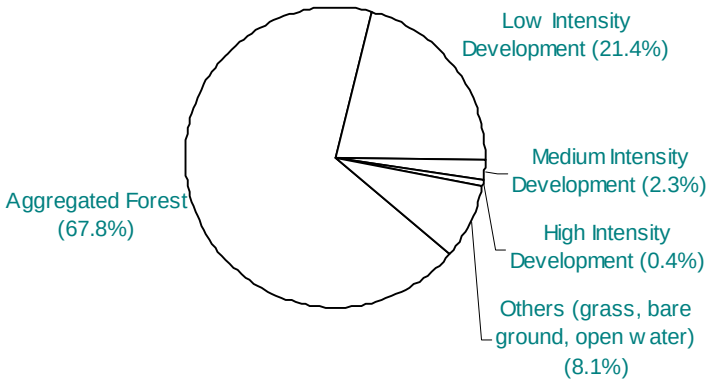


Figure 3: Landcover for the Rural Zone in KC (excluding Vashon Is.) determined through satellite imagery



Another way to look at forest cover is on a parcel basis. Table 9 shows the results of the aerial photo analysis, where staff examined approximately 5,000 parcels (~ 72,200 acres) in a 126,000 acre survey area within the rural area. This survey area represents about 67% of the area zoned rural. Forest cover was not estimated on parcels less than
Another way to look at forest cover is on a parcel basis. Table 9 shows the results of the aerial photo analysis, where staff examined approximately 5,000 parcels (~ 72,200 acres) in a 126,000 acre study area within the rural area. This study area represents about 67% of the area zoned rural. Forest cover was not estimated on parcels less than 4 acres or on parcels greater than 4 acres that contained less than 65% forest cover. Also, forest cover was not estimated on Parks, the Snoqualmie Joint Planning Area, or municipal watersheds.

In the adjusted Rural Forest District, forest cover was estimated on 1,469 parcels (41,326 acres), representing 91% of the area. These parcels contained approximately 37,600 acres of forest (approximately 83% of the adjusted district).

This analysis shows that the adjusted district still contains significant acreage of forest cover. 91% of the adjusted district is in parcels that have at least 65% forest cover, while 79% of the adjusted district is in parcels that are at least 85% forested

In the entire study area, forest cover was estimated on 5,031 parcels (72,195 acres), which represents 57% of the area. These parcels contained 64,751 acres of forest (approximately 51.4% of the area).

Table 9: Forest Cover on parcels of at least 4 acres in the rural forest study area (shown on Map2). Forest Cover was determined through analysis of 1995 aerial photos.

Adjusted District

% forest cover of surveyed parcels > 4 acres	# of parcels ≥ 4 acres	% of parcels within adjusted District	Sum of Parcel Acreage	% of District (by area)	Acres of Forest	% of Total Area Forested *
≥ 85	1,195	40	35,674	79	33,720	74.3
65 to 84	274	9	5,652	12	3,848	8.5
< 65 (not surveyed)	1,504	51	4,049	9		
Total	2,973	100 %	45,375	100%	37,568	82.8%

Surveyed Part of Rural Area

% forest cover of surveyed parcels > 4 acres	# of parcels ≥ 4 acres	% of parcels within surveyed area	Sum of Parcel Acreage	% of surveyed area (by area)	Acres of Forest	% of Total Area Forested *
≥ 85	3,230	12.3	55,114	43.7	53,260	42.3
65 to 84	1,801	6.9	17,081	13.6	11,491	9.1
< 65 (not surveyed)	21,134	80.8	53,805	42.7		
Total	26,165	100%	126,000	100%	64,751	51.4%

* sum of [(% forest cover of parcel x parcel acreage) / total area)]. Parcel acreage excludes designated Parks (as of 12/96), the Snoqualmie Joint Planning Area, and municipal watersheds.

Appendices

A. Description of Forest Practice Classes

B. Description of Current Use Taxation related to Forestry

C. Landcover Types Used in the Satellite Image Analysis

D. Lower Cedar River Landcover in Rural Tributaries (by Subbasin)

Appendix A: Description of forest practice classes under the Washington Forest Practices Act.

Washington State regulates forestry activities on state and private lands through the Forest Practices Act. This law and its corresponding rules (Washington Administrative Code 222) are designed to protect the environment while ensuring that the state continues to be a productive timber growing area. This Act describes 4 classes of forest practices. A Class I forest practice has no direct potential for damaging a public resource (defined as water, fish, wildlife, and capital improvement of the state or its political subdivision). Some examples of such practices include cutting or removing less than 5,000 board feet of timber (approximately one log truck load) for personal use in a 12-month period, road maintenance activities that do not affect water, tree planting, and precommercial thinning. Class I forest practices do not require a Forest Practice Application (FPA), but forest practice rules must still be followed so public resources are protected. Class II forest practices have less than an ordinary potential to damage a public resource. Examples include any harvest on less than 40 acres or partial cuts of less than 40% of the live timber volume. Class IV forest practices are divided into Class IV – general and Class IV-special. A Class IV-general will convert the land to a use other than forestry. A Class IV-special practice has the potential for a substantial impact on the environment. Some examples are practices that involve aerial application of pesticides, impacts to threatened or endangered species, an increase in slope instability, or impacts to registered archaeology and historic preservation sites. Class III forest practices are a catch-all for forest practices not listed as classes I, II or IV. The Forest Practice Rules define these classes in much greater detail.

Appendix B: Description of Current Use Taxation related to forestry

The Revised Code of Washington contains two current use taxation programs related to forestry: the Forestland (RCW 84.33) and the Timberland (RCW 84.34) programs. Lands enrolled in these programs are valued according to the schedule prepared by the Washington State Department of Revenue for the Timber Tax law rather than its “highest and best use”. To be eligible for the Forestland program, land must be in any contiguous ownership of twenty or more acres, and be primarily devoted to and used for growing and harvesting timber. Five or more acres of contiguous ownership are required for the Timberlands Program. These acres must also be devoted to the growth and harvest of forest crops for commercial purposes. A forest management plan is required to be approved for the Timberland Program. For Forestland Designation, the County Assessor may require the owner to submit data regarding the use of the land, productivity of typical crops, income and expense data, and similar information to continue eligibility.

Appendix C: Description of Landcover Types Used in the Satellite Image Analysis

Code	*Landcover*	*Description*
1	Mixed Forest	A mix of deciduous and coniferous forest with a minimum of approximately 10% of either type
2	Deciduous	Sparse to closed canopy of deciduous forest
3	Conifer-Early	Approximately 1-15 year old coniferous forest
4	Conifer-Middle	Approximately 15-50 year old coniferous forest
5	Conifer-Mature	Approximately 50+ year old coniferous forest
6	Recently Cleared	Land cleared or graded within the last 2 to 3 years
7	Scrub/Shrub	A mixture of shrubs, small trees, grass and bare ground
10	Grass-brown	Senescent grass, pasture or agricultural field
11	Grass-green	Growing grass, pasture or agricultural field
12	Developed Low Intensity	A mix of up to 30-40% impervious combined with trees, scrub/shrub or grass
13	Developed Med. Intensity	A mix of up to 40-80% impervious combined with trees, scrub/shrub or grass
14	Developed High Intensity	A mix of 80% or more impervious combined with scrub/shrub or grass
15	Bare Ground	Hard-packed bare ground or asphalt
16	Bare Rock	Bare rock, concrete or large expanse of white roof (some warehouses)
18	Open Water	Lakes and larger streams (greater than 50 feet across)
20	Shadow	Areas where the landcover is obscured by shadow

Appendix D: Lower Cedar River Landcover in Rural Tributaries (By Subbasin)

Subbasin Name	*Landcover*	*Acres*	*% of Basin*
Webster Lake	Bare Ground	23.01	3.80%
	Bare Rock	0.31	0.05%
	Conifer - Early	0.77	0.13%
	Conifer - Middle	3.55	0.59%
	Deciduous	171.74	28.38%
	Developed High Intensity	6.64	1.10%
	Developed Low Intensity	140.70	23.25%
	Developed Med Intensity	18.07	2.99%
	Grass - Brown	16.68	2.76%
	Grass - Green	11.89	1.97%
	Mixed Forest	128.80	21.29%
	Open Water	8.65	1.43%
	Recently Cleared	7.26	1.20%
	Scrub/Shrub	66.72	11.03%
	Shadow	0.31	0.05%
	Aggregate Forest Landcover	371.58	61.41%
	Subbasin Area	605.10	
Walsh Lake	Bare Ground	2.63	0.06%
	Conifer - Early	204.48	4.85%
	Conifer - Mature	92.97	2.21%
	Conifer - Middle	1,390.90	33.02%
	Deciduous	365.87	8.69%
	Developed High Intensity	7.26	0.17%
	Developed Low Intensity	325.87	7.74%
	Developed Med Intensity	36.29	0.86%
	Grass - Brown	30.89	0.73%
	Grass - Green	3.09	0.07%
	Mixed Forest	1,515.53	35.98%
	Open Water	69.96	1.66%
	Recently Cleared	10.66	0.25%
	Scrub/Shrub	153.05	3.63%
	Shadow	2.32	0.06%
	Aggregate Forest Landcover	3,722.80	88.39%
	Subbasin Area	4,211.76	

Subbasin Name	*Landcover*	*Acres*	*% of Basin*
Taylor Creek	Bare Ground	41.55	1.25%
	Bare Rock	1.39	0.04%
	Conifer - Early	9.42	0.28%
	Conifer - Mature	0.62	0.02%
	Conifer - Middle	6.02	0.18%
	Deciduous	827.96	24.93%
	Developed High Intensity	16.99	0.51%
	Developed Low Intensity	1,001.24	30.14%
	Developed Med Intensity	95.91	2.89%
	Grass - Brown	191.97	5.78%
	Grass - Green	32.74	0.99%
	Mixed Forest	568.96	17.13%
	Open Water	0.31	0.01%
	Recently Cleared	21.62	0.65%
	Scrub/Shrub	504.87	15.20%
	Aggregate Forest Landcover	1,917.85	57.74%
	Subbasin Area	3,321.56	

Subbasin Name	*Landcover*	*Acres*	*% of Basin*
Rock Creek	Bare Ground	65.64	0.69%
	Conifer - Early	974.68	10.31%
	Conifer - Mature	5.87	0.06%
	Conifer - Middle	1,238.46	13.10%
	Deciduous	1,523.25	16.11%
	Developed High Intensity	16.06	0.17%
	Developed Low Intensity	1,087.42	11.50%
	Developed Med Intensity	72.28	0.76%
	Grass - Brown	123.40	1.31%
	Grass - Green	93.13	0.98%
	Mixed Forest	1,885.57	19.94%
	Open Water	41.85	0.44%
	Recently Cleared	56.37	0.60%
	Scrub/Shrub	1,739.47	18.40%
	Aggregate Forest Landcover	7,367.29	77.92%
	Subbasin Area	8,923.44	

Subbasin Name	*Landcover*	*Acres*	*% of Basin*
Peterson Creek	Bare Ground	17.45	0.45%
	Bare Rock	0.77	0.02%
	Conifer - Early	18.22	0.47%
	Conifer - Mature	0.15	0.00%
	Conifer - Middle	26.41	0.68%
	Deciduous	1,082.17	28.03%
	Developed High Intensity	17.76	0.46%
	Developed Low Intensity	703.32	18.21%
	Developed Med Intensity	72.12	1.87%
	Grass - Brown	101.47	2.63%
	Grass - Green	30.89	0.80%
	Mixed Forest	1,023.33	26.50%
	Open Water	61.31	1.59%
	Recently Cleared	17.14	0.44%
	Scrub/Shrub	250.50	6.49%
	Shadow	0.31	0.01%
	Aggregate Forest Landcover	2,400.78	62.18%
	Subbasin Area	3,423.34	

Subbasin Name	*Landcover*	*Acres*	*% of Basin*
Dorre Don Creek	Bare Ground	0.77	0.09%
	Conifer - Early	6.95	0.79%
	Conifer - Middle	2.01	0.23%
	Deciduous	237.84	26.96%
	Developed High Intensity	2.47	0.28%
	Developed Low Intensity	244.17	27.67%
	Developed Med Intensity	15.91	1.80%
	Grass - Brown	27.65	3.13%
	Grass - Green	6.18	0.70%
	Mixed Forest	212.20	24.05%
	Open Water	0.31	0.04%
	Recently Cleared	5.10	0.58%
	Scrub/Shrub	120.77	13.69%
	Aggregate Forest Landcover	579.77	65.71%
	Subbasin Area	882.32	

Subbasin Name	*Landcover*	*Acres*	*% of Basin*
Cedar Hills	Bare Ground	143.01	17.48%
	Bare Rock	6.64	0.81%
	Conifer - Early	0.77	0.09%
	Conifer - Middle	1.24	0.15%
	Deciduous	205.87	25.17%
	Developed High Intensity	10.19	1.25%
	Developed Low Intensity	122.63	14.99%
	Developed Med Intensity	55.60	6.80%
	Grass - Brown	59.61	7.29%
	Grass - Green	2.32	0.28%
	Mixed Forest	105.79	12.93%
	Open Water	0.31	0.04%
	Recently Cleared	48.80	5.97%
	Scrub/Shrub	55.29	6.76%
	Aggregate Forest Landcover	368.96	45.10%
	Subbasin Area	818.07	